# A GPS DATA DICTIONARY TO SUPPORT NEIGHBORHOOD LIVABILITY AUDITS AND URBAN CODE ENFORCEMENT

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Nashville, Tennessee

- The fastest growing city in the U.S. according to a <u>USA Today</u> study (2001)

- The 11th fastest growing city in the U.S. according to a Brookings Institute study (2001)
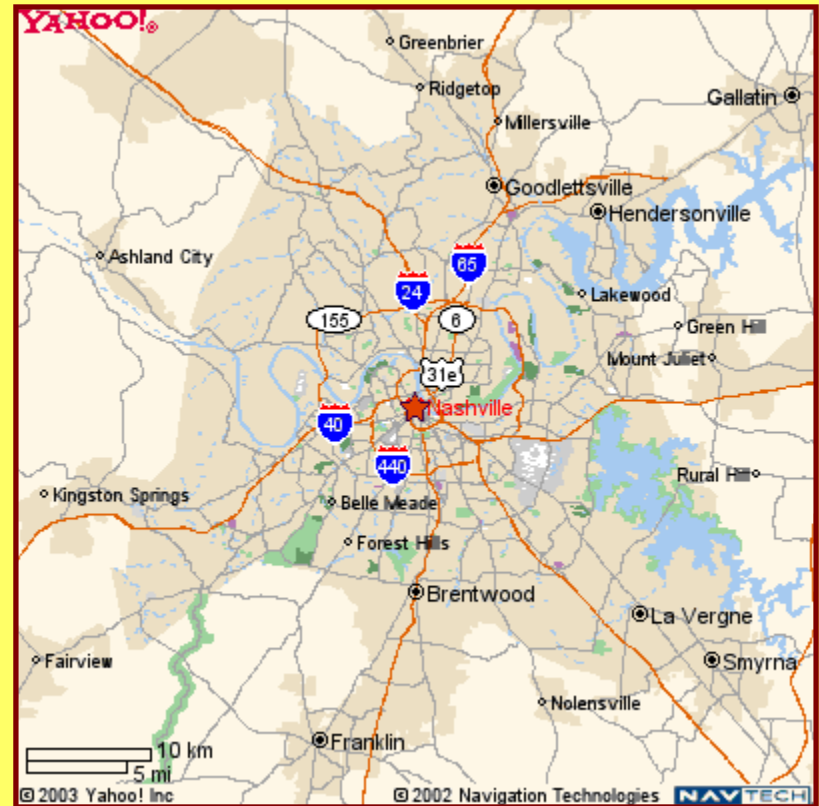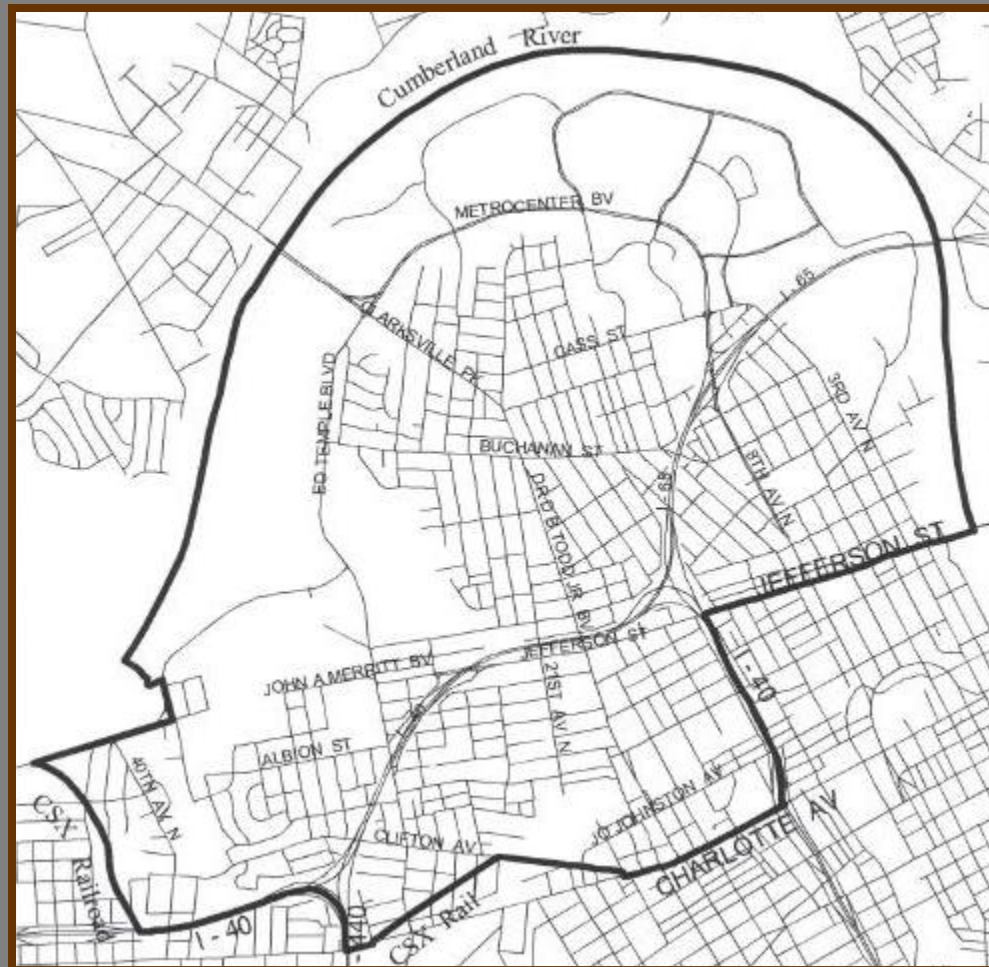
North Nashville
Neighborhood History

- One of Nashville's oldest African American communities.

- Home of Fisk University, Tennessee State University, and Meharry Medical College

- Population peaked at 43,705 in 1960, but decreased to 23,765 by 2000.

- Racial composition – 77 percent non-white in 1960 to 95 percent non-white in 2000.

- Steady loss of housing units and increase in vacancy rates since the construction of Interstate 40 during the 1960s.

North Nashville Community

# Neighborhood Livability Audits
North Nashville Community

- Numbers of abandoned buildings, overgrown vacant lots and other codes violations have become increasingly more frequent.

- Residents of Nashville's North Nashville community organize to work pro-actively to stem the tide of urban decay.

- The Mayor's Office of Neighborhoods (MOON), Neighborhoods Resource Center (NRC), and Metro Health Department organize "neighborhood livability audits" with North Nashville neighborhood organizations.

Pilot Study:
GPS and GIS Applications in the Salemtown Neighborhood Audit

- Tennessee State University Geographic Information Sciences (GISc) Lab staff join Salemtown neighborhood organizations, Metro Codes Officers, MOON, and NRC to field test the utility of GPS applications in neighborhood audits and codes enforcement.

- The North Nashville Audit Form created by the NRC is converted into a digital data dictionary.

- Potential codes violations are input as features entitled "Problem" with specific violations (dumping, dilapidated buildings, overgrown vacant lots, etc) input as attributes.

Approximate Salemtown Neighborhood Boundaries
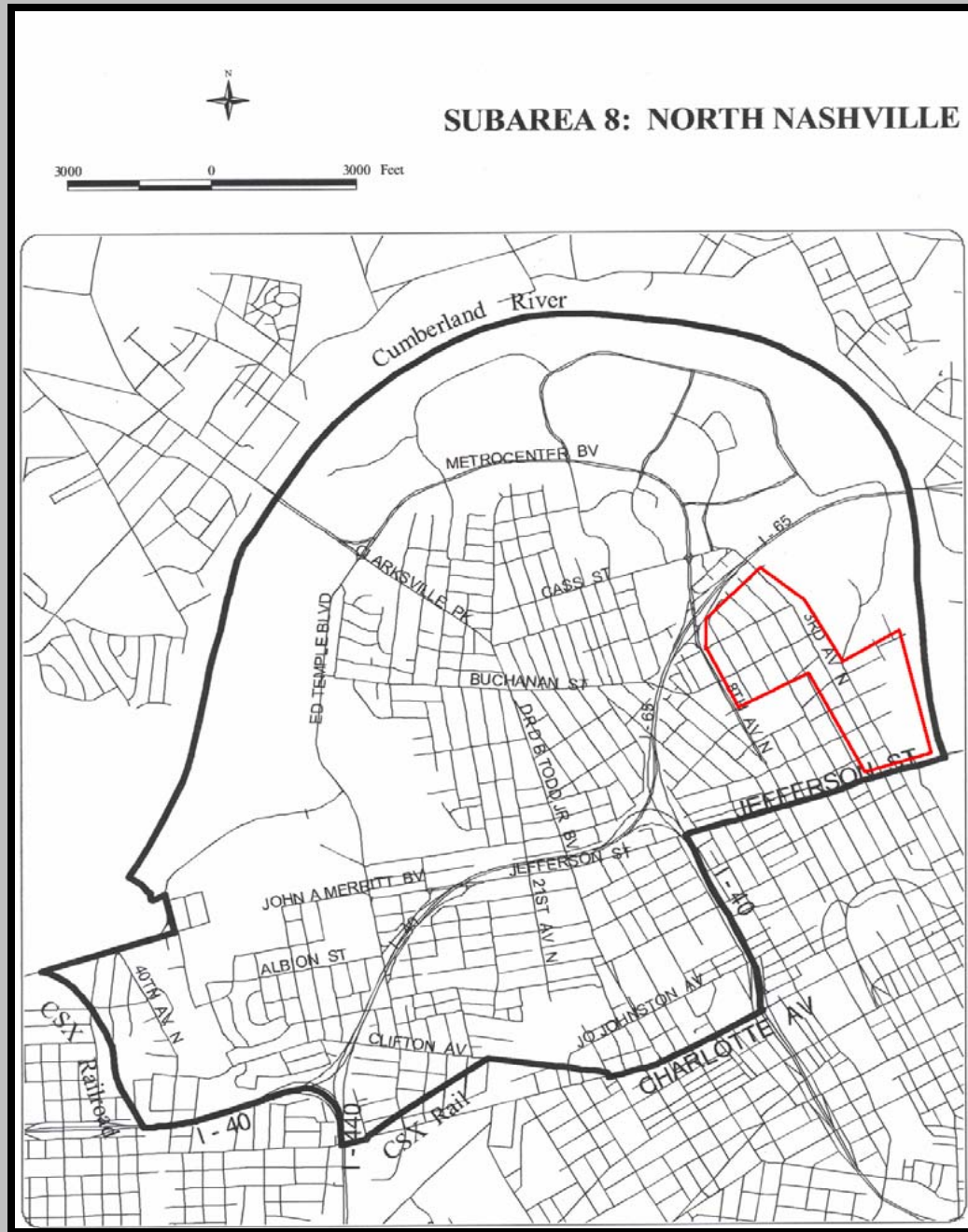
NORTH NASHVILLE NEIGHBORHOOD AUDIT FORM

August 18, 2001

DATE _____   WHAT NEIGHBORHOOD COVERED? _____

PERSON FILLING OUT FORM _____ PHONE _____ YOUR NEIGHBORHOOD GROUP _____

ADDRESS	PROBLEM (Can circle more than one problem at same address)				Check if elderly owner, etc. (explain)	DESCRIPTION / LOCATION
	Ovrgrn Vacant Lot Hsng- Unfit / Dilap Trash / Dumping Bus Stops / Shelters	Old/Unlicensed Car in Yard Abandoned Car on Street Animal Cruelty / Dog Pen Odor Rats / Unsanitary Conditions	Broken Streets / Potholes Sidewalk broken / needed Crosswalks / Street Markings Street Signs (missing, etc)	Streetlight out / needed Traffic Problems Illegal Signs / Business Alleys / Right-of-Way		
	Ovrgrn Vacant Lot Hsng- Unfit / Dilap Trash / Dumping Bus Stops / Shelters	Old/Unlicensed Car in Yard Abandoned Car on Street Animal Cruelty / Dog Pen Odor Rats / Unsanitary Conditions	Broken Streets / Potholes Sidewalk broken / needed Crosswalks / Street Markings Street Signs (missing, etc)	Streetlight out / needed Traffic Problems Illegal Signs / Business Alleys / Right-of-Way		
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NRC North Nashville Audit Form

GPS Data Dictionary

Salemtown Neighborhood
Potential Codes Violations

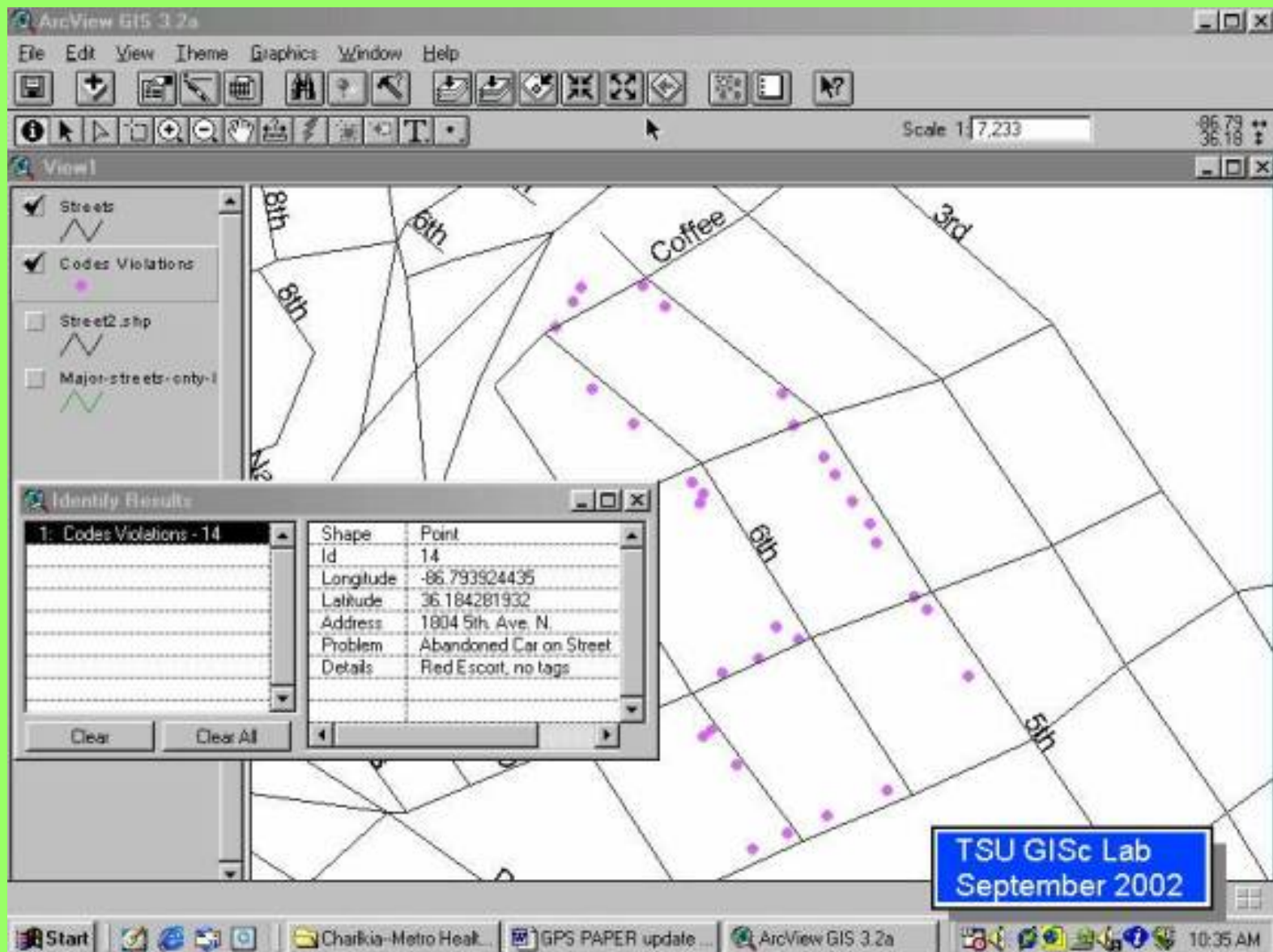# Salemtown Neighborhood Audit
GIS Map Development Process

- Latitude/Longitude coordinates of problem sites were collected using the GPS unit.

- Attribute data for problem sites were recorded on neighborhood audit forms and then keyed into the digital data dictionary.

- Neighborhood audit field data were uploaded from the GPS unit to a PC housing GPS data management software .

- Digital data were converted to text (*.txt) file format using GPS management software.

- The text file holding the site coordinates and attribute data was converted into GIS shapefile (*.shp) format.

- GIS maps were created with "pop-up" attribute data for each potential codes violation.

Salemtown Neighborhood Audit

Completed Neighborhood Audit Form

SALEMTOWN NEIGHBORHOOD AUDIT MAP WITH

POTENTIAL CODES VIOLATIONS

Salemtown Neighborhood Audit

GPS and GIS Support Applications:
Results and Lessons Learned

- GPS and GIS applications proved to be effective in graphically displaying the extent of neighborhood codes violations.

- Keeping the GPS data dictionary as simple as possible saved time during field data entry.

- Using GPS enabled more accurate location of sites without identifiable street addresses.

Salemtown Neighborhood Audit
GPS and GIS Support Applications:
Follow-up Activities

- Data were collected in decimal degrees using the same projection and datum as that used by the Metro Planning Office allowing for them to potentially be included on Metro Government online GIS maps.

- In addition to pop-up attribute data, photographs of problem sites could be added as "hot links."

- The NRC hired an intern who assisted in further developing GPS applications in neighborhood audits.

- Methods using less expensive GPS units were developed at the GISc Lab.

Neighborhood Audit Exercise

**Download spatial data from online sources –
The Geography Network
(www.geographynetwork.com) and
The Florida Department of Environmental Protection
(http://data.labins.org/2003/MappingData/DOQQ/doqq.cfm)**
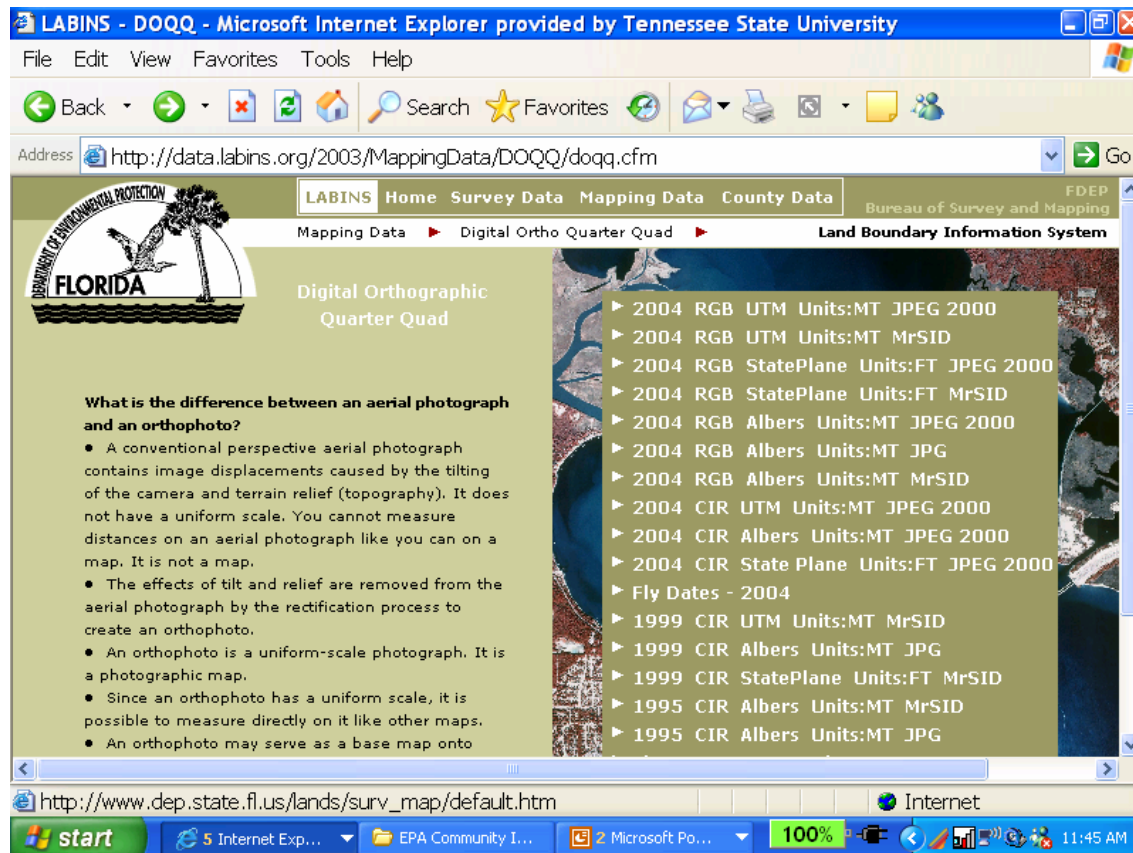
Neighborhood Audit Exercise

- **Open the downloaded ArcGIS shapefiles and Digital Ortho Quarter Quad(s) in ArcGIS**

Neighborhood Audit Exercise
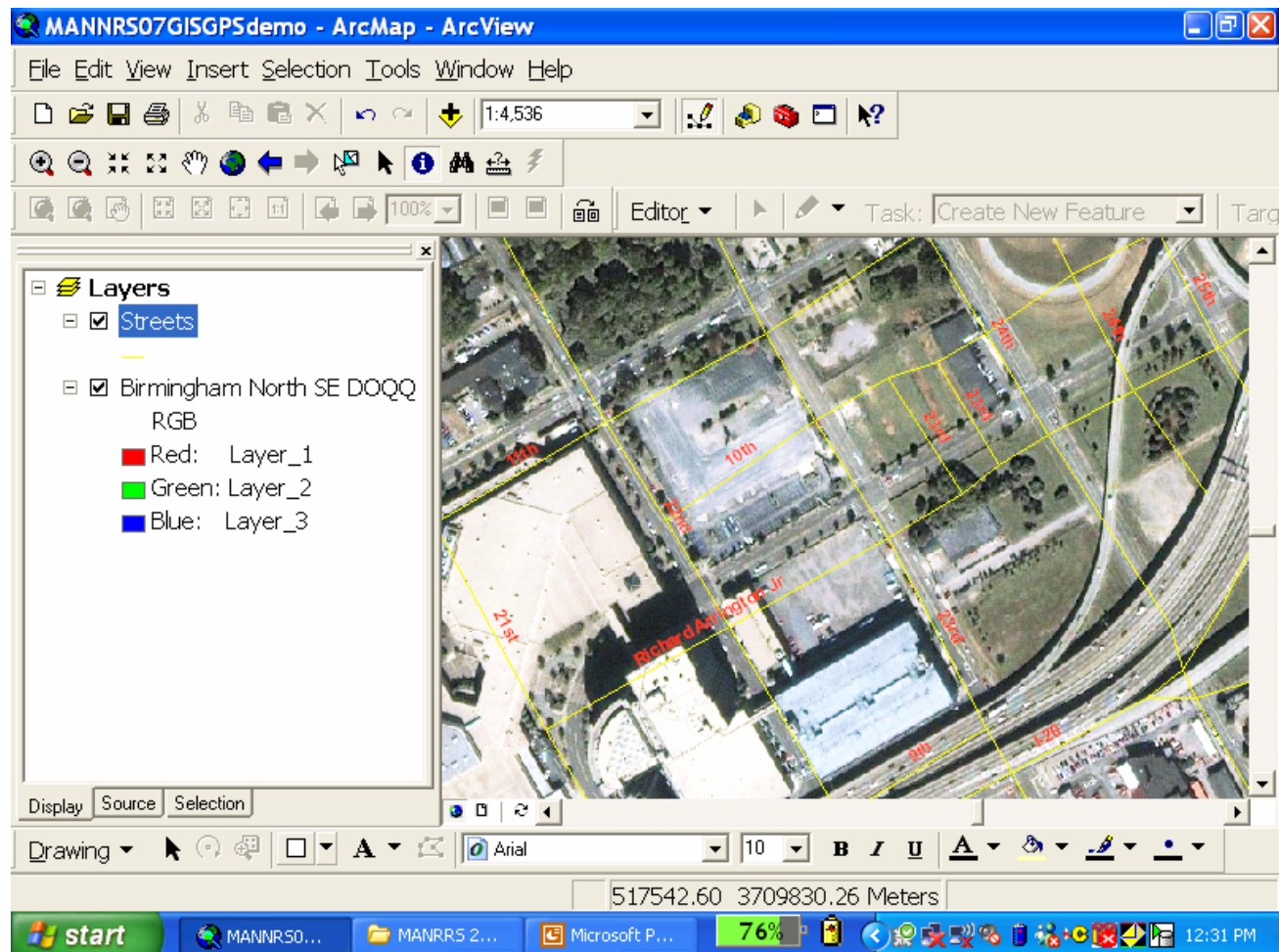
Create Neighborhood Audit Spreadsheet

Neighborhood Audit Exercise

Collect Community Data Using a Hand-Held GPS Receiver – Let's go outside!!!

Neighborhood Audit Exercise

- **Neighborhood Audit Exercise Data Spreadsheet – Saved in dBASE (*.dbf) Format**

Neighborhood Audit Exercise

- **Neighborhood audit dBASE file imported into ArcGIS using the "add XY data" function.**

Neighborhood Audit Exercise

- **Neighborhood audit problem sites displayed on aerial photograph with descriptive labels.**

Neighborhood Audit Exercise

- **Problem Site Details Displayed in ArcGIS with Attribute Table Pop-Up Box.**

Neighborhood Audit Exercise

- **Problem Sites Displayed in ArcGIS with Hyperlinked Photograph Pop-Up Boxes.**

Workshop End Notes

- **Fairly accurate work can be done even with relatively inexpensive GPS receivers due to Selective Availability being ended in the year 2000.**

- **The receiver must lock in on at least four satellites in order to get an accurate location.**

- **Always make note of the number of satellites locked in when collecting data.**

- **Buildings and dense forest canopy may interfere with the GPS signal.**

Getting Started:
GIS and Spatial Data Resources

- The Geography Network (www.geographynetwork.com)
- The U.S. Bureau of the Census (www.census.gov)
- The HBCU GIS Users Discussion Group (http://groups.yahoo.com/group/hbcugis/)
- The Remote Sensing Core Curriculum (http://www.r-s-c.org/)

Getting Started:
GIS and Spatial Data Resources

- USGS GIS Tutorial (http://erg.usgs.gov/isb/pubs/gis_poster/)

- NRCS National Cartography and Geospatial Center (http://www.ncgc.nrcs.usda.gov/)

- GPS Tutorial (http://www.colorado.edu/geography/gcraft/notes/gps/gps_f.html)

- USGS National Mapping Information Site (http://mapping.usgs.gov/)

Geographic Information Systems and Global Positioning Systems (GPS) Training Opportunities

- HBCU Summer Faculty GIS Workshop – Contact: Ms. Pamela Bingham Environmentally1@aol.com

- Center for Spatially Integrated Social Science (www.csiss.org) – Contact: Dr. Don Janelle janelle@geog.ucsb.edu

- Environmental Systems Research Institute (ESRI) – (http://www.esri.com/training)

Cartography

- In order to be an **effective** GIS user, one should complete at least one course in Cartography (the art and science of map-making).

Recommended Cartography reference source – <u>Elements of Cartography</u> by Arthur H. Robinson et al. Publisher: John Wiley & Sons (1995)
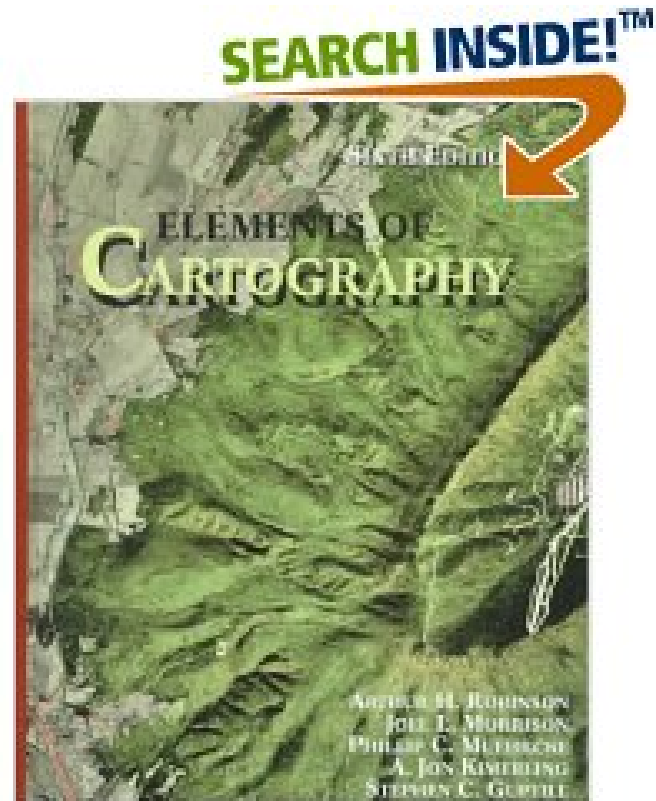
Geo-Mental

Geospatial Technology Applications in the Public Interest

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